



NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

Analysis of the Arliegh Burke Destroyer Class Damage Control Shipboard Phased-replacement Process

**By: Vincent V. Erno
Mike Snyder
June 2009**

**Advisors: K. J. Euske
Brett Wagner**

Approved for public release; distribution is unlimited.

THIS PAGE INTENTIONALLY LEFT BLANK

MBA PROJECT DISCLAIMER

The views expressed in this MBA project are those of the authors and do not reflect the official policy or position of the United States Navy, the Department of Defense or the United States Government.

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE June 2009	3. REPORT TYPE AND DATES COVERED MBA Professional Report	
4. TITLE AND SUBTITLE Analysis of the Arliegh Burke Destroyer Class Damage Control Shipboard Phased-replacement Process			5. FUNDING NUMBERS	
6. AUTHOR(S) Vincent Erno, Mike Snyder			8. PERFORMING ORGANIZATION REPORT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) COMMANDER NAVAL SURFACE FORCES			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE	
13. ABSTRACT (maximum 200 words) <p>The primary objective of this project was to provide recommendations for process changes in order to implement an effective phased-replacement program for damage control gear on Arliegh Burke Destroyer Class ships. The research for this report focused on that Damage Control equipment in Repair Locker Two. The authors analyzed the shipboard phased-replacement process to assess whether or not it was effective and adequately supporting the readiness of Repair Locker Two. The analysis was limited in scope to Fiscal Years (FYs) 2007 and 2008. A data analysis, oriented toward process improvement, was conducted based on STARS Federal Supply Group (FSG) data, shipboard interviews, Repair Locker inventories as well as ATG Subject Matter Expert (SME) opinion. The analysis was conducted on ten ships, five from the West Coast, and five from the East Coast. The analysis revealed that phased-replacement support from a standardized process in Repair Locker Two was lacking on multiple ships in the study. Based on the analysis conducted, the authors provided recommendations for a suggested phased-replacement support plan as well as recommendations for process improvement.</p>				
14. SUBJECT TERMS Phased Replacement, Arliegh Burke Class Destroyer, Damage Control, Process Improvement, DDGRON, CNSF, COMNAVSURFOR, AFMP			15. NUMBER OF PAGES 81	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UU	

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release; distribution is unlimited.

**ANALYSIS OF THE ARLIEGH BURKE DESTROYER CLASS DAMAGE
CONTROL SHIPBOARD PHASED-REPLACEMENT PROCESS**

Lieutenant Commander, Vincent V. Erno, Supply Corps, United States Navy
Lieutenant Commander, Mike Snyder, Supply Corps, United States Navy

Submitted in partial fulfillment of the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

from the

**NAVAL POSTGRADUATE SCHOOL
June 2009**

Authors:

Vincent Erno

Mike Snyder

Approved by:

Kenneth Euske, Lead Advisor

Brett Wagner, Support Advisor

William R. Gates, Dean
Graduate School of Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

ANALYSIS OF THE ARLIEGH BURKE DESTROYER CLASS DAMAGE CONTROL SHIPBOARD PHASED-REPLACEMENT PROCESSES

ABSTRACT

The primary objective of this project was to provide recommendations for process changes in order to implement an effective phased-replacement program for damage control gear on Arliegh Burke Destroyer Class ships. The research for this report focused on that Damage Control equipment in Repair Locker Two. The authors analyzed the shipboard phased-replacement process to assess whether or not it was effective and adequately supporting the readiness of Repair Locker Two. The analysis was limited in scope to Fiscal Years (FYs) 2007 and 2008. A data analysis, oriented toward process improvement, was conducted based on STARS Federal Supply Group (FSG) data, shipboard interviews, Repair Locker inventories as well as ATG Subject Matter Expert (SME) opinion. The analysis was conducted on ten ships, five from the West Coast, and five from the East Coast. The analysis revealed that phased-replacement support from a standardized process in Repair Locker Two was lacking on multiple ships in the study. Based on the analysis conducted, the authors provided recommendations for a suggested phased-replacement support plan as well as recommendations for process improvement.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

I.	INTRODUCTION.....	1
A.	BACKGROUND	1
B.	ANNUAL FINANCIAL MANAGEMENT PLAN.....	2
II.	PHASED-REPLACEMENT PROCESS IMPROVEMENT	9
A.	EOY FUNDS FOR PHASED REPLACEMENT	10
B.	PURCHASE CARD EFFECT	11
C.	CHANGES WITH FLEET RESPONSE PLAN	12
D.	CONTINUOUS MONITORING PROGRAM (CMP).....	14
E.	SEA SWAP EFFECT	14
III.	DATA COLLECTION AND ANALYSIS	19
A.	METHOD	20
B.	SHIPBOARD ANALYSIS.....	21
1.	STARS FSG Spending and Demand Data.....	23
C.	INTERVIEWS AND INVENTORIES.....	27
1.	Afloat Training Group	27
2.	Ship Visits and Inventories	28
3.	PRP Determination.....	29
IV.	CONCLUSIONS AND RECOMMENDATIONS.....	31
A.	DISCUSSION AND CONCLUSIONS	31
1.	AFMP Management.....	31
a.	<i>Problem.....</i>	<i>31</i>
b.	<i>Recommendation: Units Should Use AFMPs as a Financial Management Tool.....</i>	<i>31</i>
2.	Phased-Replacement Program	32
a.	<i>Problem.....</i>	<i>32</i>
b.	<i>Recommendation: Establish and Follow a PRP Program....</i>	<i>32</i>
3.	Purchase Card.....	34
a.	<i>Problem.....</i>	<i>34</i>
b.	<i>Recommendation: Submit Credit Card Purchase Log to CLASSRON.....</i>	<i>34</i>
4.	Continuous Monitoring Program.....	35
a.	<i>Problem.....</i>	<i>35</i>
b.	<i>Recommendation: Add Monthly AFMP and PRP Reporting via CMP.....</i>	<i>35</i>
B.	FOR FURTHER STUDY	36
1.	Related Projects	36
2.	Other Issues	36
C.	CLOSING COMMENTS	39
	APPENDIX A	41

A. AFMP MANAGEMENT	41
APPENDIX B	45
APPENDIX C	47
A. REPAIR LOCKER TWO PHASED-REPLACEMENT LISTING	47
APPENDIX D	49
APPENDIX E	51
APPENDIX F	53
APPENDIX G	57
LIST OF REFERENCES	59
INITIAL DISTRIBUTION LIST	61

LIST OF FIGURES

Figure 1.	Purchase Card Hierarchy Diagram	12
Figure 2.	LANT vs. PAC FSG Spending Data.....	24
Figure 3.	Total FSG Spending.....	25
Figure 4.	FSG High Demand Items.....	26
Figure 5.	FSG High Frequency Items	27
Figure 6.	Weighted PRP Model	29
Figure 7.	Phased-replacement Determination	46
Figure 8.	Phased-replacement Funding Flowchart.....	49

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

Table 1.	AFMP and PRP Data Received	19
Table 2.	List of the FSG Codes and Their Descriptions	21
Table 3.	FY 07 & 08 FSG Expenditures by Ship	25
Table 4.	Sample Annual Financial Management Plan	43
Table 5.	PRP Weighted Determination	45
Table 6.	Suggested Phased-replacement Item List for Repair Locker Two	47
Table 7.	Suggested GPC Purchase Card Log for use at the Unit Level for Submission to the DDGRON and TYCOM.....	51
Table 8.	Suggested AFMP for the DDGRON for Use in Projecting Quarterly Budget Grants	53
Table 9.	Suggested AFMP for the TYCOM for Use in Projecting Budget Grants	57

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

AFMP	Annual Financial Management Plan
APL	Allowance Parts Listing
BOR	Budget OPTAR Report
DDG	Guided Missile Destroyer
CLASSRON	Class Squadron
CNSF	Commander, Naval Surface Forces
CNA	Center for Naval Analyses
CNO	Chief of Naval Operations
CO	Commanding Officer
DLR	Depot Level Repairable
DNUW	Deployed Not Underway
DoD	Department of Defense
EIC	Equipment Identification Code
EOY	End of Year
FC	Fund Code
FMB	Navy Office of Budget
FRP	Fleet Response Plan
FY	Fiscal Year
GAO	Government Accountability Office
GPRA	Government Performance and Results Act
ISL	Integrated Stock Listing
LANTFLT	Atlantic Fleet
MFOM	Material Figure of Merit
NAVSEA	Naval Sea Systems Command
NIIN	National Item Identification Number
OCONUS	Outside the Continental United States
OPNAV	Office of the Chief of Naval Operations
OPTAR	Operating Target
OPTEMPO	Operation Tempo
PACFLT	Pacific Fleet

SNSL	Stock Number Sequence Listing
SO	Other Consumable Cost Element
SR	Repair Parts Cost Element
STARS	Standard Accounting and Reporting System
SWE	Surface Warfare Enterprise
TAD	Temporary Additional Duty
TYCOM	Type Commander
XO	Executive Officer

ACKNOWLEDGMENTS

We would like to acknowledge and thank Ms. JoAnn Flavin, CAPT Brian Drapp Ms. Julie Webb and Mr. Albert Pena at Commander, Naval Surface Forces for all of the time and support given during the research and development of this MBA project. Also, we would like to recognize our project advisors Professor Kenneth Euske and Commander Brett Wagner. Their time, patience and guidance were invaluable during the MBA project process. Lastly, we would like to thank our families for their unwavering support and understanding during the last 18 months. Without them, the completion of this project would not have been possible.

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

A. BACKGROUND

For the general phased replacement of shipboard equipment, Commander, Naval Surface Forces (CNSF), states in the 4400.1, Surface Force Supply Procedures Manual (SURFSUP):

Various items on board ships have limited service life. Generally, these items are in constant use and have predictable wear, destruction, or loss patterns. Piecemeal replacement often leads to inefficient expenditure of funds, unexpected shortages of gear, and lack of financial control. Establishment of a phased-replacement Program will ensure better availability and financial control over consumable expenditures .¹

The primary objective of this project is to provide recommendations for process changes in order to implement a more effective phased-replacement program for damage control gear on Arleigh Burke Destroyer Class ships. The research for this report focused on the Damage Control equipment in Repair Locker Two. The authors analyzed the shipboard phased-replacement process to assess whether or not it was effective and adequately supporting the readiness of Repair Locker Two. The analysis was limited in scope to Fiscal Years (FYs) 2007 and 2008. A data analysis, oriented toward process improvement, was based on STARS Federal Supply Group (FSG) data, shipboard interviews, Repair Locker inventories as well as ATG Subject Matter Expert (SME) opinion. The analysis was conducted on ten ships, five from the West, and five from the East.

The current process of shipboard phased replacement of material afloat is conducted by the Supply Department and Supply Officer onboard the ship. The responsibility for phased replacement of equipment falls on the ship's Supply Officer as the ship's financial manager. CNSF requires the shipboard Supply Officer, via guidance from the SURFSUP, to maintain detailed financial records with phased-replacement

¹ Commander, Naval Surface Forces. COMNAVSURFOR INSTRUCTION 4400.1. Surface Force Supply Procedures. San Diego, CA. 2008.

Plans (PRP) that can be archived and passed on to subsequent Supply Officers to assist in maintaining a level of continuity as well as working to mitigate a possible future dip in readiness that could result from the natural process of turnover on the ship.²

Supply Officers in Department Head Afloat positions on warships serve 24 months or longer as the Supply Officer. This afloat tour can be shorter in length to facilitate reaching various career milestones needed for promotion. As mentioned, the turnover of shipboard Supply Officers every 24 months can lead to knowledge loss on the ship every time a Supply Officer transfers and a new one comes onboard. One way to lessen the knowledge loss for the incoming officer is to conduct a thorough turnover of the duties of the shipboard Supply Officer as well as a review of departmental personnel and of the records in the Supply Office. The turnover process for the new Supply Officer, which can last anywhere from a few days to a week, allows the incoming officer a chance to familiarize him or herself with the ship, get checked into the command and to review Supply Department records and files.³

B. ANNUAL FINANCIAL MANAGEMENT PLAN

The AFMP, which is a document that essentially outlines the ship's spending plan for the upcoming Fiscal Year, is created annually and submitted to the Class Squadron (CLASSRON). The AFMP is also required to be updated quarterly at the unit level to account for requirement changes throughout the year. One section of the AFMP includes a phased-replacement Plan (PRP) for shipboard materiel. The PRP includes items from many different areas of the ship that have been identified as needing to be replaced on a scheduled basis depending on their expected service life.⁴

² Commander, Naval Surface Forces. COMNAVSURFOR INSTRUCTION 4400.1. Surface Force Supply Procedures. San Diego, CA. 2008.

³ The Naval Supply Systems Command. (1999). *It's your Career* Figure 1-1 General Career Development Path.

⁴ Commander, Naval Surface Forces. COMNAVSURFOR INSTRUCTION 4400.1. Surface Force Supply Procedures. San Diego, CA. 2008.

Current guidance on phased replacement can be found in the SURFSUP. This guidance requires that an AFMP include a phased-replacement section that is updated every Fiscal Year and kept on file throughout the year. Further, the Type Commander (TYCOM) which inspects its ships on regular basis during the Supply Management Certification (SMC) has included the requirement for an AFMP as a checklist item for the Supply Officer. The Supply Officer must have a completed AFMP with a PRP available for inspection.⁵ The excerpt below, taken from the COMNAVSURFINST 5040.1A, shows the checklist items that fall under the AFMP category. These items to be included in the AFMP were deemed to be essential by CNSF as part of the yearly budget planning process:

Relational Supply Accountability (RMA) 024. A detailed Annual Financial Management Plan (AFMP) was developed. The Ombudsman Reimbursement Program was incorporated in the Command AFMP. (SURFSUP/7806 para b)

RMA025. The AFMP was updated each quarter. (SURFSUP/7100)

RMA026. A phased-replacement Program was established and incorporated into the AFMP.⁶

To amplify the above information with regards to the guidance as cited in the SURFSUP, the following guidance on the detailed AFMP and PRP is provided in the below excerpt:

7100. ANNUAL FINANCIAL MANAGEMENT PLAN (AFMP) An effective financial management plan is essential for the optimum management of an OPTAR. The plan must be dynamic and sensitive to the operational mission of the ship and should make sure funds are available for material readiness. Participation of the Commanding Officer, Executive Officer, and all Department Heads in developing and adhering to the AFMP through, at a minimum, a monthly meeting called specifically to review execution and update the plan for the remainder of the fiscal year, is essential. AFMPs are mandatory for all Surface Force ships, staffs, and commands provided OPTARs or AFTs. Guidance for

⁵ Commander, Naval Surface Forces. COMNAVSURFOR INSTRUCTION 4400.1. Surface Force Supply Procedures. San Diego, CA. 2008.

⁶ Ibid.

developing such a plan is in Appendix F. Surface Force units will develop the AFMP based on assigned OPTAR. The Commanding Officer must be aware of funding limitations and requirements, and must decide which requirements to fund.⁷

The AFMP does not start with the input of the Supply Officer. The AFMP starts with a request to the other departments in his or her unit. The Supply Officer must request through the other Department Heads what they foresee they will need in the upcoming year. The input of the other Department Heads is reviewed by the Supply Officer and is incorporated into departmental budgets. Guidance on departmental budgets is outlined in the below excerpt taken from the SURFSUP:

DEPARTMENTAL BUDGET

The Departmental Budget is the base for the AFMP. Distribution of funds in an AFMP should be based on factual data to the maximum extent possible. It is emphasized, however, that whereas past usage serves as a basis for estimating normal future requirements, forecasts of requirements based on the forthcoming fiscal year's operating schedule must also be used. The projected allocation of funds for the procurement of material requirements not carried in shipboard storerooms is important.⁸

Based on the feedback and inputs the Supply Officer receives from the other department heads in his unit, the shipboard Supply Officer must calculate the departmental funding targets for the upcoming quarters and the Fiscal Year. The departmental budget guidance in its entirety can be found in Appendix A. Part of the guidance to accomplish the calculations and complete the AFMP is set forth below:

Determine Tentative Departmental Funding Targets. Within the total expected funding and based on the past four to six quarters' historical data, with similar periods appropriately weighed, the Supply Officer should assign tentative funding targets to the departments.⁹

⁷Commander, Naval Surface Forces. COMNAVSURFOR INSTRUCTION 4400.1. Surface Force Supply Procedures. San Diego, CA. 2008.

⁸ Ibid.

⁹ Ibid.

Once these steps are complete, the Supply Officer returns the tentative budget back to the other Department Heads. After the Department Heads review the tentative budgets, they may need to justify other adjustments in funding levels or priorities. After the Department Heads resubmit and work out the details with the Supply Officer, the tentative budget is submitted to the Commanding Officer (CO) for approval.¹⁰

As observed by one of the researcher's during his shipboard afloat tour, the CO may have differing priorities and direct adjustments to the budget that he and the Executive Officer (XO) feel better meets the needs of the ship in the upcoming fiscal year. The CO then returns the budget to the Supply Officer for review and implementation. Once the budget is implemented, the Supply Officer and other Department Heads should have monthly budget meetings in which they sit down and review the budget and offer changes based on the ever changing needs and priorities of the various departments on the ship. Based on those meetings, the Supply Officer submits changes to the CO for approval. After approval is granted, the Supply Officer transmits the AFMP to the CLASSRON to be retained on file. The phased-replacement section of the financial plan must be adhered to, in order to prevent a drop in unit readiness at points during the FY.¹¹

Throughout the year, Supply Officers must manage spending while they have outside forces influencing them. Based on the experience of the authors, the outside forces could include: 1) Department Heads who may not have submitted correct requirements at the beginning of the year. 2) The XO and the CO, who want to ensure the ship is at the highest possible level of material readiness. 3) The CLASSRON, who may change the ships inspection phases or operational requirements. 4) CNSF, who may change the ships deployment schedule with very little notice. 5) Fleet Forces Command, who may need a ship to host dignitaries while at an unscheduled port visit. There are

10 Commander, Naval Surface Forces. COMNAVSURFOR INSTRUCTION 4400.1. Surface Force Supply Procedures. San Diego, CA. 2008.

11 Ibid.

multiple outside forces that affect the Fiscal Plan throughout the year. The Supply Officer is required to review and update the financial plan at least quarterly and make needed adjustments. As outlined in the SURFSUP:

UPDATE THE PLAN.

Operating schedule changes and other events may make the plan obsolete before year's end. Accordingly, update the plan when major changes occur, but no less than quarterly. A recommended time to use the review process is following the preparation of the first departmental budget report of the last month of each quarter. This gives time to review most of the current quarter actual data and establish an updated plan for the subsequent quarter before it starts.¹²

Given the impact of changes on a ship's budget, phased-replacement purchases may also be affected by moving the planned purchases to a later quarter. Pushing requirements to a future quarter solves the short-term need for the funds. However, deferring these purchases may result in a decrease in readiness over time. For example, the practice of reallocating purchase requirements to future quarters on Sea Swap ships, ships that change out their crew every 6 months while on extended deployments has become common place and is classified as an unintended consequence of the DDG Sea Swap program on the East Coast.¹³ Afloat Supply Officers need to review the AFMP, make the required updates and forward any new requirements of funding to the CLASSRON for assistance. The CLASSRON has the following responsibility to the TYCOM for funding sent to the units under them:

¹² Commander, Naval Surface Forces. COMNAVSURFOR INSTRUCTION 4400.1. Surface Force Supply Procedures. San Diego, CA. 2008.

¹³ *First Atlantic Fleet Sea Swap Crews Will Have Time To Adapt To New Ships*. (2004, October). Defense Daily, 224(7), 1.

CLASS SQUADRON (CLASSRON)/IMMEDIATE SUPERIOR IN COMMAND (CLASSRON) RESPONSIBILITIES

CLASSRONs/CLASSRONs are responsible to the TYCOM for the proper management of funds granted to their units and funds provided for support of their own staffs. CLASSRONs/CLASSRONs must be aware of their units' requirements and management effectiveness, ensure consistent application of published policy and procedures for financial management, and take action as necessary to keep the TYCOM fully informed about the readiness of subordinate ships and units as affected by funding policies and grants.¹⁴

The TYCOM has the following responsibilities to the CLASSRON and subordinate units:

TYPE COMMANDER RESPONSIBILITIES

a. The TYCOM is responsible for administering funds by equitably evaluating requirements and distributing funds responsibly, effectively monitoring the management of funds within the Force, and developing justification to support requests to the Fleet Commander for additional funding.¹⁵

Both the CLASSRON and TYCOM have the responsibility to effectively monitor the management of funds.¹⁶

¹⁴ Commander, Naval Surface Forces. COMNAVSURFOR INSTRUCTION 4400.1. Surface Force Supply Procedures. San Diego, CA. 2008.

¹⁵ Ibid.

¹⁶ Ibid.

THIS PAGE INTENTIONALLY LEFT BLANK

II. PHASED-REPLACEMENT PROCESS IMPROVEMENT

Since the objective of this project is to assess the current process of phased replacement for Damage Control equipment in Repair Locker Two onboard Guided Missile Destroyer Class Squadron (DDGRON) ships, with the goal being recommendations for improvement, analysis needed to be conducted using process improvement theories. The purpose of this chapter is to discuss the processes and issues present onboard DDGRON ships to identify key process areas that may need improvement. To better understand these issues and the methodology behind process improvement, it is useful to discuss background on these issues as well as the goals of process improvement.

A Business Process Improvement Model (BPI) is used for the analysis. The main goals of BPI in any organization are the alignment of the process to the goal of the organization.¹⁷ In this case, the goal was to find a method to standardize the process by which the ship orders phased-replacement material during the fiscal year and ensures that business is being conducted in the most cost efficient way possible.

Data collected and analyzed from ships on both coasts indicated several process issues that may lead to the poor phased-replacement management of damage control equipment. Some of the process items identified were: the use of EOY funds to solely fund the purchase of phased-replacement items, the use of the ships Consumable (SO) and Repair (SR) Purchase Card programs in the procurement of phased-replacement items, the negative effects of the Fleet Response Plan (FRP) as it relates to the phased-replacement readiness levels, the lack of systematic reporting via the Continuous Monitoring Program (CMP), and the effects of the Sea Swap program on proper execution of the PRP. The authors discuss each of these issues in the following sections of this chapter.

¹⁷ R.B. Chase, R.F. Jacobs, N.J. Aquilano. (2006). Operations Management for Competitive Advantage (11ed.). New York, NY: McGraw Hill.

A. EOY FUNDS FOR PHASED REPLACEMENT

As observed by the researchers, the use of EOY funds to primarily fund the purchase of phased-replacement equipment is a result of the current funding environment where budgets have been consistency cut over the past decade. Additionally, as observed by one of the author's during his afloat shipboard Department Head tour, the use of EOY funds for the purchase of the FY phased-replacement deficiencies seemed to be commonplace and could be dangerous. This danger could result in a degradation of safety equipment, when material readiness suffers as a result of the possible lack of a windfall at the end of the year. One view is that Supply Officer's on ships should only have phased-replacement equipment on the list of items to procure for the ship with EOY funds when they are attempting to procure PRP deficiencies. Based on one of the author's experience and feedback from the TYCOM during his Department Head tour afloat, these deficiencies should be identified as early as possible. The need should be discussed with the CLASSRON Supply Officer who can assist the shipboard Supply Officer in contacting the TYCOM for resolution options. Further, depending on where the ship happens to be in the FRP cycle will drive the decision to grant an augment or not.¹⁸ In the researchers experience, those ships that happen to be in maintenance availabilities will likely be last on the priority list when it comes to funding and may find themselves behind the power curve when they emerge and are readying their unit for work-ups. The CLASSRON can also reallocate funds from units that have time prior to their deployment in favor of those units that are preparing to deploy within 90 days.¹⁹

¹⁸ H.C. Keeter (2004, May). *Roughhead: Executing FRP Means Projecting Power Quickly*. Sea Power, 47(5), 36, 38, 40.

¹⁹ Commander, Naval Surface Forces. COMNAVSURFOR INSTRUCTION 4400.1. Surface Force Supply Procedures. San Diego, CA. 2008.

B. PURCHASE CARD EFFECT

The use of the SO and SR purchase cards in the Government Purchase Card Program (GPC) to fund the replacement of phased-replacement equipment onboard ships is a procurement option for fleet ships.²⁰ In an effort to analyze purchase card spending trends, spending data was obtained from ships for this project. Generally, the use of afloat purchase card programs is restricted to the procurement of those items under \$3,000 per transaction.²¹ The purchase card adds flexibility to the unit level procurement process by allowing the unit to purchase qualifying items in an expeditious manner. This flexibility comes in handy and saves time when the alternative is to place the same items on order if they have Navy Stock Numbers (NSN's). The purchase card can also come in handy when material is needed within a day or two or when delivery times on material needed for operational commitments will exceed one week.²² As observed by the authors, the shipboard purchase card programs are also used to procure phased-replacement equipment. Several circumstances warrant the use of such action. For example, when equipment fails prematurely as a result of poor quality, that equipment must be replaced in the most expeditious manner possible. These types of actions can be annotated on the AFMP phased-replacement list and taken into consideration when responding to CLASSRON data calls for unfunded requirements listings.

The purchase cards can become the default for phased-replacement purchases which may lead to a lack of adequate reporting for these requirements. During the FSG 42 code credit card analysis conducted by the authors, it was determined that the majority of purchases made using the purchase cards at the unit level were not visible to the CLASSRON or TYCOM.

²⁰ NAVSUPINST 4200.99 Encl (1-2).

²¹ Ibid.

²² Ibid.

Figure 1 from the NAVSUPINST 4200.99 depicts the hierarchy of the purchase card program from the Activity Program Coordinators (APC), to the Financial Managers (FM), to the Approving Official (AO), to the individual Card Holders (CH). However, currently there is not any required periodic purchase reporting by the ships to the CLASSRON or TYCOM except during SMC.

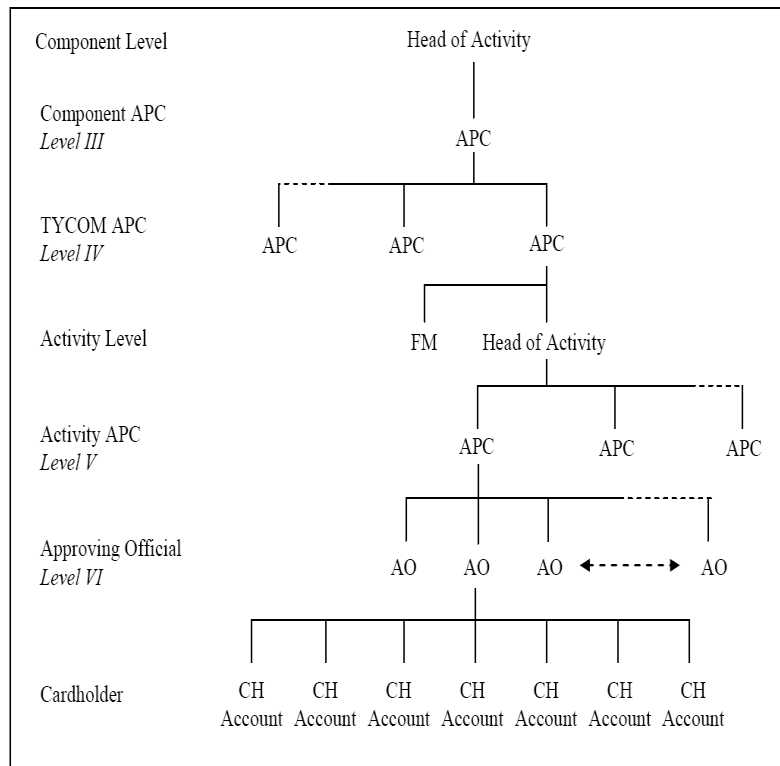


Figure 1. Purchase Card Hierarchy Diagram²³

C. CHANGES WITH FLEET RESPONSE PLAN

The FRP requires that ships be deployable on short notice in support of U.S. interests around the world. The traditional 24 month cycle, which takes a ship from a 6 month deployment, puts the unit in the yards for a period of 3-6 months, then into the work-up cycle in preparation for the next deployment was predictable and safe from a financial planning perspective. With the shift by the Navy to the FRP cycle and the

²³ NAVSUPINST 4200.99 Encl (1-2).

reduction in the number of ships available for tasking, FRP fundamentally changed the way the Navy does business.²⁴ The new FRP readiness guidelines basically dictate that ships need to be employable 55 percent of the time as opposed to being deployed 25 percent of the time.²⁵ This new guidance has had effects across the Navy as units adjust their OPTEMPO to meet the new guidelines. Admiral Gary Roughhead, during his first few months at the helm as Second Fleet Commander, stated in May 2004 about his top priorities,

First, refining the FRP and making it as responsive and as versatile as it possibly can be. Ultimately, our job is to project power forward and to be able to project power in many different places at the same time. That is the key thrust. The FRP is about the need to be in many places, with credible power, quickly. If you start with that premise and begin to package and train your forces always keeping that in mind, then it becomes rather easy to, for lack of a better term, operationalize the FRP. That is very simplistic of me to say, but there are a lot of people working very hard to make this happen.²⁶

In examining the effects of FRP, the Navy's personnel have most certainly felt brunt of the shift in global OPTEMPO. Admiral Roughhead stated in the same interview in 2004, when asked, "What does this program mean to the fleet's Sailors and Marines and their leaders?"²⁷ He responded,

We now have a force that is more employable for a longer period of time. [Employable refers to the readiness of a force to carry out missions; deployed forces are those actually at sea.] The old construct, which was a 24-month [maintenance, training and deployment] cycle, we have now expanded to a 27-month cycle. In the old cycle, you were deployed 25 percent of the time. In the FRP, you are now employable about 55 percent of the time. So the initial challenge of the FRP was to have those deployments back down to the six-month period. As people looked at it, they said, 'Well, I am going to be gone more often because I can be.' That

²⁴ H.C. Keeter (2004, May). Roughhead: Executing FRP Means Projecting Power Quickly. *Sea Power*, 47(5), 36, 38, 40.

²⁵ Ibid.

²⁶ Ibid.

²⁷ Ibid.

is not what has happened. We are still deploying and, after resetting the force after [Operation Enduring Freedom] and [Operation Iraqi Freedom], we are committed to keep [deployments] at six months. But you also now have that additional time where you are employable [if needed].²⁸

FRP further highlights the need for the unit to be in tip-top shape at all times when it comes to material readiness. Good, well managed and funded phased-replacement programs are essential to material readiness.²⁹

D. CONTINUOUS MONITORING PROGRAM (CMP)

The CMP, which is a program used by the TYCOM and DDGRON to track specific logistics key indicators on the ship, does not include the tracking of phased-replacement equipment higher than the unit organization. It can be argued that given the DDGRON is responsible for dispersing the funds down to the unit level, the incorporation of shipboard PRP oversight into the CMP could result in increased unit level readiness.

E. SEA SWAP EFFECT

The concept of swapping crews on DDG class ships, called “Sea Swap”, is as a money saving initiative which has been employed over the last 10 years. As CAPT Pat Allen, Deputy and Chief of Staff for Commander, Naval Surface Forces Atlantic, told reporters during a media briefing in October 2004, on the test swap out of the crew on the USS Gonzalez (DDG 66),

²⁸ H.C. Keeter (2004, May). Roughead: Executing FRP Means Projecting Power Quickly. Sea Power, 47(5), 36, 38, 40.

²⁹ GAO Report, *Military Readiness, The Navy is making progress implementing its Fleet Response Plan, but has not fully developed goals, measures and resource needs*. GAO-08-264 (Washington, DC.: February 1st, 2008).

The main purpose of the sea swap maneuver is to generate more on-station time for Navy combatants. Another benefit is cost savings on transit between the naval bases in San Diego and Norfolk, Va., and regions like the Arabian Gulf. The reason it makes sense is because this whole regimen of sea swapping crews provides the capability to extend our on-station time in the theater where the ship is operating.³⁰

The Sea swap program has presented a host of new challenges and hurdles for the crews of these ships to overcome in addition to their everyday duties. The stress of changing ships, which often times have different Combat Control Systems onboard, can take its toll on a crew and their leadership. In the experience of the authors, a crew generally has ample time to become absolutely familiar with every aspect of their ship prior to taking the ship on deployment and employing all the ship has to offer in defense of the country. In addition, deck plate ownership of a ship is vitally important in the success of that ship. The crew must know that their efforts will not be lost when they are swapped out. For example, during shipboard interviews, crewmembers mentioned that space cleanliness and preservation declined during periods where the ship was deployed for an extended period of time during sea swap operations and that keeping crew motivation levels high presented a unique challenge for the leadership. Successes for programs such as DLR management, as well as the phased replacement of equipment, may potentially be in jeopardy unless the leadership takes the appropriate steps to prevent the breakdown.³¹

The Navy recognizes the challenges that go along with the sea swap program. In November 2004, the GAO stated,

GAO recommends that the Secretary of Defense direct the Secretary of the Navy to systematically evaluate the feasibility and cost-effectiveness of rotational crewing alternatives; specify standard policies and procedures to ensure consistent management and accountability for ships during crew rotations; collect, record, and disseminate lessons learned; and conduct a

³⁰ *First Atlantic Fleet Sea Swap Crews Will Have Time To Adapt To New Ships*. (2004, October). Defense Daily, 224(7), 1

³¹ *GAO Report Recommends Navy Evaluate Sea Swap Methodology*. (2004, November). Defense Daily, 224(23), 1

study of the maintenance process that includes all ships involved in rotating crews, the report, titled Force Structure: Navy Needs to Fully Evaluate Options and Provide Standard Guidance for Implementing Surface Ship Rotational Crewing [GAO-05-10], said.”³²

DOD agreed with the statements of the GAO, they responded to the first recommendation with,

Established metrics, along with a systematic process to collect and assess program objectives, will allow for the accurate analysis of alternative rotational crewing options.³³

For the second recommendation, DoD expressed,

Naval Surface Forces Atlantic is in the process of developing standards and procedures. Lessons learned from Sea Swap are being compiled into a database,³⁴

DoD further expressed in its assessment of GAO's third recommendation,

The Navy is continuing its review of rotational crewing to include "all maintenance processes" used to support surface forces. The Navy supports Sea Swap because it believes it can still retain high combat capabilities while not compromising on presence.³⁵

The Center for Naval Analyses in Alexandria, VA, a federally-funded center that conducts research and development for the Navy and DOD, was commissioned to conduct a study on the sea swap program between the Spruance-Class Destroyer USS Fletcher and the Guided-Missile Destroyer USS Higgins, while the ships were deployed to the Arabian Gulf and Western Pacific. Upon completion of the study in 2002, the CNA released the following statement:

³² *GAO Report Recommends Navy Evaluate Sea Swap Methodology*. (2004, November). Defense Daily, 224(23), 1.

³³ Ibid.

³⁴ Ibid.

³⁵ Ibid.

The U.S. Navy's Sea Swap experiment was "clearly a success," according to a new report about the program, with the ships involved maintaining a high level of readiness during the roughly 18-month study period. But the same report questions whether the savings offered by the swaps—in funding and operations—are worth the burden the program places on sailors in terms of work and quality of life.³⁶

When examining the overall effects on the crews involved, the CNA's report stated,

In some ways, the amount of training and maintenance effort went beyond the levels for typical deployers. Moreover, in some cases, the crews did not reap the full benefits of their extra efforts because they turned the ship over to a new crew rather than enjoying the fruits of their labors.³⁷

The experiments generated "33 percent more forward presence than traditional deployers," because the vessels stayed on-station so much longer than a normal rotation, but the swaps weren't without consequence. The CNA study says Sea Swap could have a negative [affect] on morale and retention of the participating service members.³⁸

Survey results indicated that the sailors protested the implicit changes in Navy culture and the extra work. ... The strong, overall negative tenor of the survey results cannot be entirely discounted and attributed to a penchant for complaining.³⁹

The PRP process issues discussed in this chapter underscore the areas where process improvement may be necessary. Fleets practices such as: the use of EOY funds to primarily fund the purchase of phased-replacement items, the use of the ships SO and SR Purchase Card programs in the procurement of PRP items, the potential negative effects of the FRP, the lack of systematic reporting via the CMP, and the effects of the

³⁶ P. Kime (2004). *CNA Report on Sea Swap Exercises Gives Experiment Mixed Reviews*. Sea Power, 47(9), 32,34.

³⁷ Ibid.

³⁸ P. Kime (2004). *CNA Report on Sea Swap Exercises Gives Experiment Mixed Reviews*. Sea Power, 47(9), 32,34.

³⁹ Ibid.

Sea Swap program all have real effects on shipboard readiness levels and on the proper execution of the PRP. In the next chapter, the authors discuss the data collection and analysis performed as a result of the ship visits, repair locker inventories as well as SME interviews and FSG demand data analysis. The objective is to provide recommendations for PRP process improvement, taking into account the previously discussed issues.

III. DATA COLLECTION AND ANALYSIS

This chapter discusses the data collection efforts and analysis conducted for this project. Research data collected for this report was collected in three ways: 1) onsite shipboard visits with the assistance of CNSF that included personnel interviews as well as inventories of Repair Locker Two, 2) STARS FSG data received via e-mail from CNSF and, 3) data collected via e-mail regarding submission of all required reports. Requested data from units included FY07 and FY08 AFMP's including the available PRP, Repair Two Equipment Guide Listing (EGL) information to include shortfalls, and any Damage Control free issued material from Damage Control warehouses. During the onsite visits, interviews took place with the Damage Control Assistants (DCAs), Leading Damage Controlman and other pertinent personnel.

The data collection from DDG 51 class ships for this project was facilitated by CNSF. Participating ships that did not have or were unable to provide specific pieces of research data were noted as N/A and are listed in the below table. Table 1 shows the AFMP and PRP data received from each unit.

Table 1. AFMP and PRP Data Received

<u>UIC</u> <u>PAC</u>	<u>NAME</u>	<u>HULL #</u>	<u>AFMP 07</u>	<u>PRP 07</u>	<u>AFMP 08</u>	<u>PRP 08</u>	<u>AFMP 09</u>	<u>PRP 09</u>
21947	DECATUR	73	Received	N/A	Received	N/A	Received	Received
21950	HIGGINS	76	Received	N/A	Received	N/A	Received	Received
21313	JPJ	53	Received	Received	Received	Received	Received	Received
23151	GRIDLEY	101	N/A	N/A	Received	N/A	Received	Received
23166	STERETT	104	Precomm	Precomm	Precomm	Precomm	Received	Received
LANT								
21660	BARRY	52	N/A	N/A	N/A	N/A	N/A	N/A
21833	GONZALEZ	66	N/A	N/A	N/A	N/A	Received	Received
21941	COLE	67	N/A	N/A	N/A	N/A	N/A	N/A
21948	MCFAUL	74	N/A	N/A	N/A	N/A	Received	Received
23165	TRUXTON	103	Precomm	Precomm	Precomm	Precomm	N/A	N/A

As indicated in the table above, the majority of the East Coast ships were unable to provide the required information for this project. Additionally, the authors were unable to obtain AFMP and PRP data from either the TYCOM or CLASSRON of the units.

Shipboard Repair Locker Two inventories took place in San Diego, CA onboard units stationed there. During the first inventory onboard *USS Gridley (DDG 101)*, an inventory report using the Damage Control inventory system DCOSIMS was provided. In addition to the physical inventory conducted, the DCOSIMS report provided documentation on the current book inventory as well as shortfalls in Repair Locker Two. During follow-on inventories on the other units, the authors requested the latest DCOSIMS reports.

A. METHOD

The research for this report focused on that Damage Control Equipment that falls under phased replacement in Repair Locker Two. By conducting analysis on a narrow list of items, we were able to focus on process improvement for efficiency and readiness in Repair Locker Two. Ideally, the process identified would be generalizable to all phased-replacement items, not only the DDG 51 class, but all classes of surface ships. The overall goal of this process improvement is cost savings to the Navy. The authors analysis of the inventory related data provided evidence that Repair Two readiness was being met, however, there were some material shortfalls that seem to be common among the ships from which data was collected. These common shortfall items represented possible PRP fleet issues as the items were not readily available in the Navy Stock System or the commercial market.

B. SHIPBOARD ANALYSIS

The CNSF comptroller provided a complete list of the Repair Locker Two FSG requisitions made by the ships involved in the research. This data was pulled by CNSF from the STARS database system and is shown in Table 2. The expenditure data is compared to the PRP within each FY AFMP. To better understand the background behind the FSG and FSC codes, Naval Supply Systems Command (NAVSUP) explains,

The Federal Supply Classification (FSC) is designed to permit the classification of all items of supply used by the Federal Government. Each item of supply will be included in one, and only one, FSC. The FSC is made up of 2 two digit numeric codes: the Federal Supply Group (FSG) and the Federal Supply Classification. The Federal Supply Group identifies, by title, the commodity area covered by classes within the group.⁴⁰

Table 2. List of the FSG Codes and Their Descriptions

FSG	Description
10	Weapons
11	Nuclear ordnance
12	Fire control equipment
13	Ammunition and explosives
14	Guided missiles
15	Aircraft and airframe structural components
16	Aircraft components and accessories
17	Aircraft launching, landing, and ground handling equipment
18	Space vehicles
19	Ships, small craft, pontoons, and floating docks
20	Ship and marine equipment
21	Unassigned
22	Railway equipment
23	Ground Effect vehicles, Motor vehicles, trailers, and cycles
24	Tractors
25	Vehicular equipment components
26	Tires and tubes
27	Unassigned
28	Engines, turbines, and components
29	Engine accessories
30	Mechanical power transmission equipment
31	Bearings

⁴⁰ NAVSUP P485 Volume 1, 1997, p. 2-7.

32	Woodworking machinery and equipment
33	Deleted
34	Metalworking machinery
35	Service and trade equipment
36	Special industry machinery
37	Agricultural machinery and equipment
38	Construction, mining, excavating, and highway maintenance equipment
39	Materials handling equipment
40	Rope, cable, chain, and fittings
41	Refrigeration, air conditioning and air circulating equipment
42	Fire fighting, rescue, and safety equipment
43	Pumps and compressors
44	Furnace, steam plant, and drying equipment, and nuclear reactors
45	Plumbing, heating, and sanitation equipment
46	Water purification and sewage treatment equipment
47	Pipe, tubing, hose, and fittings
48	Valves
49	Maintenance and repair shop equipment
50	Unassigned
51	Hand tools
52	Measuring tools
53	Hardware and abrasives
54	Prefabricated structures and scaffolding
55	Lumber, millwork, plywood, and veneer
56	Construction and building materials
57	Unassigned
58	Communication, detection and coherent radiation equipment
59	Electrical and electronic equipment components
60	Fiber optics, materials and components
61	Electric wire, and power and distribution equipment
62	Lighting fixtures and lamps
63	Alarm and signal security detection systems
64	Unassigned
65	Medical, dental, and veterinary equipment and supplies
66	Instruments and laboratory equipment
67	Photographic equipment
68	Chemicals and chemical products
69	Training aids and devices
70	General purpose automatic data processing equipment, software, supplies and support equipment
71	Furniture
72	Household and commercial furnishings and appliances
73	Food preparation and serving equipment
74	Office machines, data processing equipment and visible record equipment
75	Office supplies and devices
76	Books, maps, and other publications
77	Musical instruments, phonographs, and home-type radios
78	Recreational and athletic equipment

79	Cleaning equipment and supplies
80	Brushes, paints, sealers, and adhesives
81	Containers, packaging, and packing supplies
82	Unassigned
83	Textiles, leather, furs, apparel and shoe findings, tents and flags
84	Clothing, individual equipment and insignia
85	Toiletries
86	Unassigned
87	Agricultural supplies
88	Live animals
89	Subsistence
90	Unassigned
91	Fuels, lubricants, oils, and waxes
92	Unassigned
93	Nonmetallic fabricated materials
94	Nonmetallic crude material
95	Metal bars, sheets, and shapes
96	Ores, minerals, and their primary products
97	Unassigned
98	Unassigned
99	Miscellaneous

Source: NAVSUP P- 485

1. STARS FSG Spending and Demand Data

Since Repair Locker Two equipment fall under multiple FSG codes, it is useful to establish baseline demand data that provides the ability to make spending data comparisons. This FSG spending and demand data is analyzed, illustrated and discussed in this section.

The objective of the comparisons made in the below graphs and summary table is two-fold: 1) to illustrate demand patterns for FSG Repair Locker Two items and, 2) to gain a better understanding of the funds expended on FSG Repair Locker Two items by ships on the East and West Coasts for FYs 07 & 08. This information was subsequently compared to funding grants listed in the AFMPs provided by the units to establish whether the funds allocated by DDGRON on a quarterly basis were used on the Damage Control equipment. Further, this data informed the PRP determination model and allowed the authors to examine whether or not a disparity in funding amounts existed between units of either coast for FYs 07 & 08. The differences in actual spending listed in the figure below versus those amounts reported in the ships AFMPs would allow the authors

to determine whether the PRPs were being followed or not. However, due to multiple incomplete data sets from the units with regard to AFMP data, it was difficult to tell whether the PRP was being followed and updated throughout the year.

Figure 2 illustrates a disparity in FSG expenditures for items in Repair Locker Two between LANT and PAC Fleets in FYs 07 & 08. In FY08, LANT Fleet expenditures were three times that of PAC Fleet.

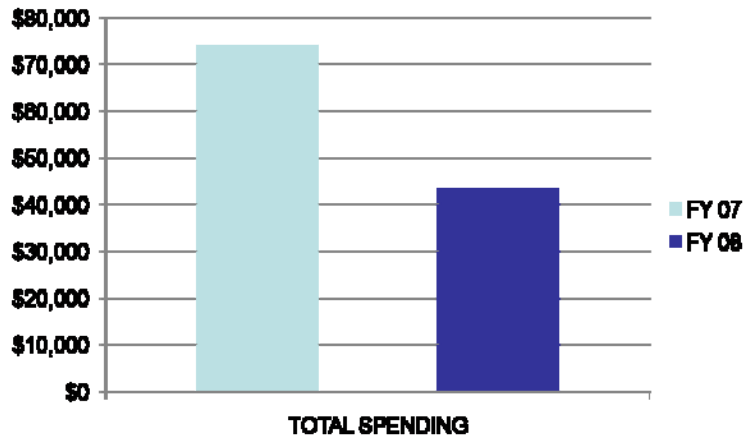


Figure 2. LANT vs. PAC FSG Spending Data

Figure 3 illustrates Total FSG expenditures for items in Repair Locker Two for both LANT and PAC Fleets in FYs 07 & 08. There is a disparity in total spending between the two FYs.

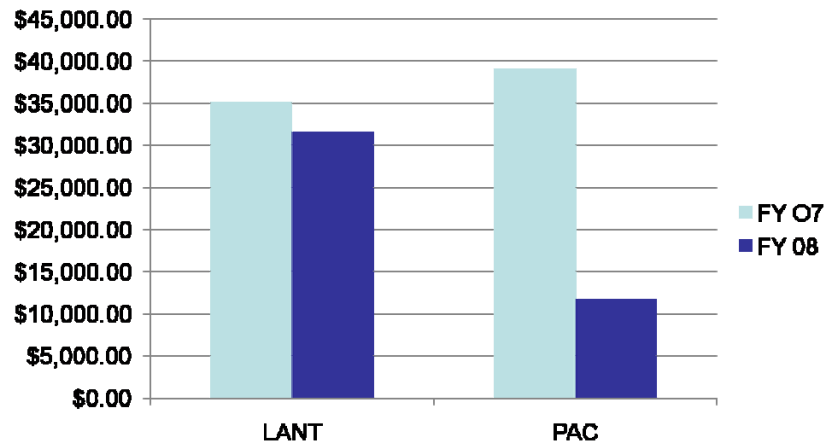


Figure 3. Total FSG Spending

Table 3 below summarizes FSG expenditures by ship for the units that participated in the study. FSG information on those ships that were PRECOMM units during the study was not available and is noted below.

Table 3. FY 07 & 08 FSG Expenditures by Ship

UIC	Ship	FY 07	FY 08
PAC			
21947	JPJ	\$2,288.38	\$11,255.03
21950	DECATUR	\$13,572.84	\$0.00
21313	GRIDLEY	\$2,504.76	\$290.23
23151	STERETT	Precomm	\$214.64
23166	HIGGINS	\$20,666.06	\$0.00
LANT			
21660	MCFAUL	\$17,334.58	\$1,967.88
21833	COLE	\$4,888.09	\$3,260.80
21941	GONZALEZ	\$5,533.94	\$17,264.99
21948	BARRY	\$7,333.13	\$9,018.56
23165	TRUXTON	Precomm	Precomm

Figure 4 shows items within Repair Two that experienced the highest demand for FYs 07 & 08. For the purposes of this project, high demand was defined as the total number of Repair Two items ordered by units with a demand over 72 (highest 10 percent of the data set) for the combined FYs. Data for PRECOMM units in the study (3 out of 10) was not available for this analysis.

Highest demand item was for 404 feet of cable. This meant that the average amount of cable purchased by a ship each year was 28.86 feet (i.e., $404 \text{ (feet)} / 7 \text{ (ships)} / 2 \text{ (years)} = 28.86 \text{ feet per yr}$). However, only one ship purchased cable, which was purchased by the foot. Given our focus on the the top ten percent of the items, the high demand item cut off point was set at 72. The 72 items (i.e., pairs of mens gloves equated to 1.07 pair of gloves per ship per year (i.e., $72 / 7 / 2 = 5.14 \text{ per yr}$), as listed in Appendix B. In determining the PRP list, the authors included these items in determination of the items that should be included on the PRP list. However, average across a class of ships might mask the needs of an individual ship

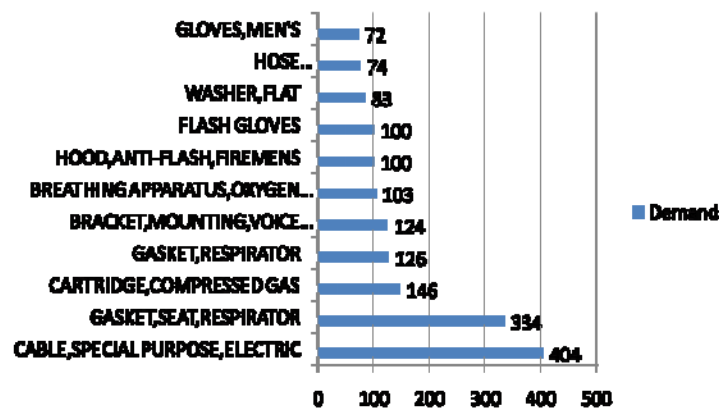


Figure 4. FSG High Demand Items

A measure of specific demand by a ship would be the frequency an item is ordered. Figure 5 shows items within Repair Two that had a total greater than 15 requisitions over FYs 07 and 08 combined. The items listed in Figure 5 had the most individual requisitions of all the items listed in the FSG data provided. Highest frequency was 30 requisitions which would be 2.14 requisitions per ship (i.e., $30 \text{ (reqs)} / 7 \text{ (ships)} / 2 \text{ (yrs)} = 2.14 \text{ per yr per ship}$). The high frequency item cut off point was set at 15 items

(representing the highest 10 percent of the data set). Lowest frequency was 15, or 1.07 per ship (i.e., $15 \text{ (reqs)} / 7 \text{ (ships)} / 2 \text{ (yrs)} = 1.07 \text{ per ship}$). An analysis of the frequency, coupled with demand data on a particular item ordered, provides useful information about demand and availability of items in the system.

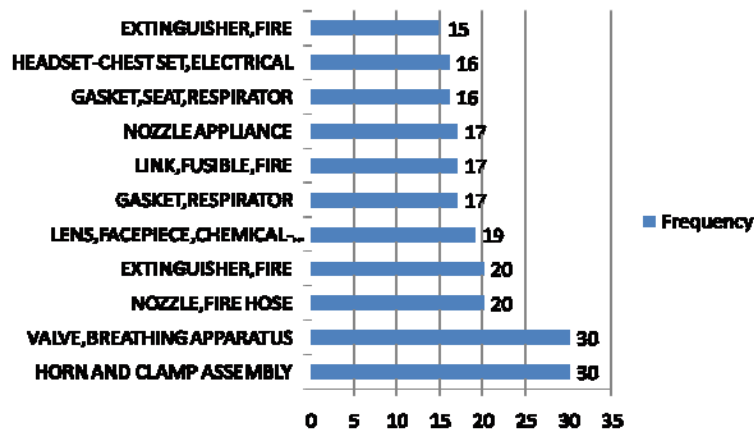


Figure 5. FSG High Frequency Items

C. INTERVIEWS AND INVENTORIES

1. Afloat Training Group

During the course of the research for this project, the authors were able to gain insight from the Subject Matter Experts (SMEs) at ATG regarding DDG 51 Class Damage Control issues. Specifically, a DCCS, a Damage Control trainer and shipboard inspector at ATG, provided the authors with a list of the top readiness degraders as well as insight on such issues such as shelf life, training, and leadership challenges. The insight provided was invaluable in better understanding the fleet issues that pertain to our research.

2. Ship Visits and Inventories

As the authors were unable to collect data in a standardized format from all units participating in the study as originally planned, it became important to gather as much sample data as possible via physical shipboard inventories and through interviews with leadership on the ship as well as SMEs. In this section, the authors discuss the sample data collected as well as findings from the multiple interviews and Repair Locker Two inventories.

Data gathered during shipboard visits indicated that there are some common items that were difficult to obtain through normal supply channels for the ships. The difficult-to-obtain items included: Flash Hoods, Flash Gloves, Dragger Tubes, Firefighting Hoods, Fire Fighting Ensembles, Firefighting Coveralls, Firefighting Gloves, Firefighting Helmet Replacement Parts (face shields), SCBA replacement parts (voice amps, masks), Batteries and Flashlights.

Repair Locker Two onboard a DDG 51 class ship has an allowance of 12 sets of flash gear. To properly maintain the Personnel Protective Equipment (PPE), multiple sets must be on order and received on a constant basis to enable the crew to maintain adequate numbers in the repair lockers as well as being able to replace sets sent regularly to be laundered or for disposal. During the shipboard personnel interviews and ATG SME interviews, the authors were told that trying to keep the correct amount of PPE in the lockers so personnel can obtain a clean satisfactory set for their own personnel use is a challenge.

The inventories provided evidence that the readiness of Repair Two Lockers were above 90 percent in multiple cases. However, the authors discovered the processes used to purchase phased-replacement material differed greatly among ships visited and were not standardized in a format that facilitated tracking.

For example, during the shipboard interviews, the authors found that the Damage Control Assistant's were ordering material for the Repair Locker's without communication about the requirements to the Supply Officer. In multiple cases, the lack of communication resulted in requisitions being canceled by Supply Department due to lack of available funding.

Additionally, in multiple cases, orders for phased replacement were not on any organized list which could be tracked by Supply Department. The lack of an organized list worked against the units due to the fact that the Damage Control Assistant's thought they were ordering the material they needed and Supply Department on the ship was not aware of any issues until inventory issues in the repair lockers developed.

3. PRP Determination

As outlined in Appendix B, the authors used a process made up of the STARS FSG data, along with the sample data collected through the shipboard inventories and interviews, to establish a divisional PRP listing. All the data sets collected during the study were incomplete in some manner. However, the authors wanted to use all the information collected, and attempted to combine the information from all four data sets. The authors weighted equally each data set that informed the model. An argument could be made to weigh the input differently from each data set. However, the authors could not identify a variable weighting scheme that is superior to the equal weightings. The PRP listing, listed in Appendix B is the result of the weighted-average model illustrated in Figure 6. The listing of items from each data source (i.e., Onboard Inventories (OI), Shipboard Interviews (SI), Subject Matter Experts (SMEs) and Stars Demand Data (SDD)) were all assigned the weights of .25. After the analysis was conducted, a baseline was established at .75. The .75 benchmark was chosen because it reflected a PRP item that is common, in that all the ships ordered it, was determined to be essential, and was supported by at least three of the four data sets. The model provided a viable PRP listing consistent with the data received by the authors.

$$OI(.25)*SI(.25)*SME(.25)*SDD(.25)>.75$$

Figure 6. Weighted PRP Model

THIS PAGE INTENTIONALLY LEFT BLANK

IV. CONCLUSIONS AND RECOMMENDATIONS

A. DISCUSSION AND CONCLUSIONS

1. AFMP Management

a. Problem

As stated earlier in a reference to the SURFSUP, units are required to submit an AFMP which includes the PRP at the beginning of each Fiscal Year to DDGRON who can then forward to the TYCOM as needed. In multiple cases, the authors found no evidence of submission of the FY07 & 08 AFMPs to the CLASSRON or even the existence of the document onboard the ship. The AFMP serves as the baseline for the shipboard purchases throughout the year.

b. Recommendation: Units Should Use AFMPs as a Financial Management Tool.

It is understood that priorities may shift throughout the FY. However, that underscores why it is crucial to have a financial plan that the ship can revise and adjust quarterly. The submission of the AFMP will assist the CLASSRONS and TYCOM in preparing long-term budgets and facilitate the collection of valuable data which can be forwarded to the office of the CNSF Comptroller. A sample AFMP is contained in Appendix A and can serve as a guideline for shipboard units. Within this plan there must be an accurate PRP to assist units in meeting readiness goals. Unit readiness is paramount in today's operating Navy under the principles of the FRP, and a solid financial plan is paramount in planning for success.

2. Phased-Replacement Program

a. Problem

With all the shipboard material that requires periodic replacement based on the OPTEMPO of the unit, units are not keeping detailed PRP listings to assist in the systematic ordering of the needed PRP items.

b. Recommendation: Establish and Follow a PRP Program.

The authors have established a suggested list of items to be purchased each quarter for Damage Control Divisions with regards to Repair locker Two based on the PRP Model discussed in the previous chapter. This list includes:

Flash Hoods

Flash Gloves

Firefighting Ensembles

Firefighting Coveralls

Self Contained Breathing Apparatus (SCBA)

Firefighting Gloves

Firefighting Hoods

Firefighting Helmets

Firefighting Boots

Dragger Tubes

Batteries

Emergency Water Activated Repair Patch (EWARP)

The above list, amplified in Appendix B, can be adjusted according to a ship's specific class and needs. The divisional PRP should contain current inventory levels and shortfalls for use in placing the needed equipment on order based on the life cycle.

After the Division completes the phased-replacement order form, it should be submitted to the Department Head for his approval and then to the unit's Supply Officer as outlined in the SURFSUP. Once the unit's Supply Officer receives the divisional inputs, the Supply Officer then has the needed input to complete the PRP as shown in Appendix C. This plan will be included in the AFMP and presented to the CO for approval. Throughout the Fiscal Year, the PRP should be reviewed by the divisions, departments and the Supply Officer quarterly to ensure any oversights or new requirements are documented. After the revised PRP is completed, the revised AFMP should be sent to the CO for approval. Adherence to these procedures should keep all members within the process informed while ensuring all data is considered carefully throughout the Chain of Command.

Once the CO has approved the AFMP, the plan should be sent to the ship's CLASSRON. At the CLASSRON level, the budget analysis personnel can compile the information to present a class level funding estimate for phased replacement for the upcoming year. By doing this, the CLASSRON is able to reorganize funding in order to support the readiness needs of each ship throughout the Fiscal Year. The CLASSRON can use this data to present a budget estimate to the SURFOR Comptroller. This budget estimate will contain data which can be compared to the actual funding budget held at SURFOR. This process is outlined in Appendix D. TYCOM personnel can also use this data in multiple ways to include: the compilation of the CLASSRON data to obtain a total figure of the estimated phased-replacement Cost throughout the Fleet as well as maintaining the ability to make comparisons across all surface classes. This data could also be used by the TYCOM to determine if there are similar issues resident across different classes of ships. Finally, the data may be used to determine the funds needed to expend on specific items annually.

The data received and analyzed at the CLASSRON and TYCOM levels will only be as good as the inputs from the unit level. If the ships are not reporting PRP as required, or are only reporting once a year based on the requirements generated in previous years, the unit may find themselves underfunded, with no data submission on file at DDGRON to back up funding requirements. This PRP data will serve as a check and balance to ensure the funding set aside for phased replacement is actually spent on the items needed to improve readiness.

3. Purchase Card

a. Problem

The current Government Purchase Card (GPC) system tracks purchases made at the unit level using the SO and SR purchase cards. During the research conducted by the authors, it was determined that the majority of purchases made using the purchase cards were not visible to the CLASSRON or TYCOM.

b. Recommendation: Submit Credit Card Purchase Log to CLASSRON

To alleviate this problem along with the end-of-quarter submission of items purchased, the authors created a credit card purchase log, as seen in Appendix E. This log would attempt to capture data regarding the purchase of material for phased replacement. To ensure compliance, this requirement could be added to the SURFSUP as checked by ATG during shipboard inspections as well as being included in the CMP program.

By enacting this purchase card log reporting recommendation, the data could be collected at the CLASSRON level. This data in turn could be analyzed at the TYCOM level to improve the process in which phased replacement is accomplished across the surface fleet. Moreover, this reporting process could also allow CNSF to capture historical data on phased replacement to ensure the units are using those funds to increase the readiness of repair lockers.

4. Continuous Monitoring Program

a. Problem

Presently, the shipboard Supply Officer accesses the CMP at least weekly. No AFMP or PRP info is tracked via this reporting vehicle to the CLASSRON.

b. Recommendation: Add Monthly AFMP and PRP Reporting via CMP

Adding a monthly or quarterly reporting feature to the CMP to capture submitted AFMP's and PRP's monthly, could be value added to the CLASSRON who oversees the readiness of the units under them. The increased reporting requirement by the Supply Officer may facilitate better financial management and phased-replacement purchases on the ship. The only additional work that would be required by the Supply Officer is the actual submission of the data. The Supply Officer should have this data readily available if he or she is updating his or her plans throughout the year, which is consistent with current guidance. After receipt of the data at either the CLASSRON or TYCOM, budget personnel could then determine if any large deficits in replacement items are affecting readiness levels.

Further, the continuous collection of data through an organized process would allow the CLASSRON and TYCOM to have more accurate data on phased replacement at their fingertips. With this data in hand, they could also conduct data analysis and make policy decisions for improvement of implemented processes.

B. FOR FURTHER STUDY

1. Related Projects

A possible area for further research is the use of the SO and SR GPC at the unit level to purchase items. Those items purchased using the GPC are not able to be easily tracked without a formal reporting requirement put into place. During the data collection conducted for this project, the authors were not able to collect usable GPC purchase data from the CNSF selected units.

Another area that could be further developed is the analysis of the feasibility of adding AFMP and PRP data to the CMP reporting criteria. Specifically, discussed in the recommendations section, CMP reporting of financial and phased-replacement data could be conducted simply by using drop down menus in the program itself, having the Supply Officer acknowledge there was a review of both the AFMP and PRP. The goal of such reporting would be to increase transparency in a process where all personnel at the unit level, CLASSRON and TYCOM have visibility and ability to query data when necessary.

2. Other Issues

Several issues were brought to light during the interviews and inventories conducted as part of the research for this project. Discussion of these issues and resolutions are covered in this section.

Shipboard personnel discussed the shelf-life of Dragger Tubes and Emergency Water Activated Repair Patches (EWARP). Dragger Tubes are generally purchased thru the Navy Stock System. However, when the tubes finally arrive, the shelf life may only be about six months before the Dragger Tubes must be discarded. To overcome this lifecycle issue, ships in San Diego have been open purchasing the tubes on the commercial market. By open-purchasing the tubes, the units get the full life of two years vice only six months. A downside of units making purchases this way is that the Navy loses the economies of scale for making the purchases at a lower price.

EWARP has a shelf life of about 18-24 months after they are placed on the ships. Not being an item that is used often and can only be used once, they may sit on the shelf until expired. A comment of one DCCS at ATG was, “I’ve used the EWARP 4 to 5 years after the expiration and the patches have worked just fine”.⁴¹ The EWARP may be a case where the fleet should submit a feedback report to examine the shelf-life requirements to determine the correct longevity.

Firefighting Ensembles, Firefighting Boots, and Firefighting Coveralls have also become shortfall items in the lockers on the ships the authors visited. The lockers all had the correct number of firefighting equipment items. However, the problem lies with the variation of sizes of the equipment and the Sailors ability to properly fit into the gear. For example, if a typical hose team consists of eight personnel and the locker only has eight complete sets of firefighting equipment, the locker leader needs to ensure that the members all fit in the protective equipment correctly. As the authors observed on the ships visited, having the correct sizes is rare. As a result, during a shipboard drill, sailors who should be in a size nine boot are wearing a size thirteen or vice versa, which can lead to possible safety hazards and issues with wear and tear.

Additionally, Fire Fighting replacement parts may be an area for improvement. The authors noticed that the face shields on fire fighting helmets were broken in multiple cases as well as several broken straps were noticed on SCBA masks. This can be cause for concern as these items tend to break periodically or deteriorate beyond acceptable condition for use. As it stands, the authors could not identify any vehicle to order just the face shield to restore the firefighting helmet to acceptable use. Moreover, two other items closely related to this problem are the voice amps for the SCBA masks and the helmet light on the Fire Fighting Helmet. There is no NSN to order only the straps, voice amps or parts for the SCBA. Based on feedback from the ships the authors visited, this has led to the purchasing of new equipment (whole firefighting helmets or SCBA face pieces) or

⁴¹ ATG, email with authors, 16 April, 2009

the cannibalization of older equipment to ensure the locker readiness levels are met. When cannibalization takes place on the SCBAs, a DCCS pointed out, “you will be left with only a cylinder cage that gets thrown away.”⁴²

In correcting some of the shortfalls, Leading Damage Controlman or the Damage Control Assistants directed personnel to look for items at the Damage Control Warehouse. The Damage Control warehouse, located in San Diego, CA was set up to facilitate the dispersment of used and new excess Damage Control assets to the waterfront ships on an as needed basis. The objective of the warehouse is to provide a way for waterfront ships to correct shortfalls by obtaining free issue parts. However, during an interview with a Damage Controlman onboard *USS STERETT (DDG 104)*, the authors were informed the warehouse has multiple management problems that they believed prevented it from fully meeting the ship’s needs. For example, one issue brought to light by shipboard personnel was the fact the warehouse was not well organized, making it difficult to find specific parts unless the parts were large enough to pick out of a group. As a consequence, the interviewees explained this disorganization left them sifting through boxes for hours to find any items that may be needed. While the authors were not able to actually visit the warehouse during the study, the disorganization may have been the result of an overwhelming amount of equipment recently received as part of a large L class ship decommissioning.

The last area brought to our attention during an interview with ATG was that of training. A general lack of adequate training currently may exist at all levels on the ship from the junior Damage Controlman assigned to take care of the locker all the way up to the senior leadership onboard. Ship casualty drills are part of everyday life on a Navy ship and are important for teaching the crew how to fight casualties and possibly save the ship. The problem arises after the drills. The Damage Controlman in charge of the lockers may not have the time or training to get the lockers ready for the next set of drills or actual casualty. One DCCS pointed out that there is “about a dozen R checks after a Condition I drill, this requires about 6 to 7 hours of maintenance time per locker.”⁴³ This

⁴² ATG, email with authors, 16 April, 2009.

⁴³ ATG, email with authors, 16 April, 2009.

time and effort could be even longer based on the Repair party personnel improperly stowing items in the locker, which could lead to damaged equipment. This can lead to a downward spiral for the Locker Maintenance personnel who continue to battle to ensure the equipment is kept in good order.⁴⁴

C. CLOSING COMMENTS

The scope of this study was limited to just those phased-replacement items in Repair Locker Two onboard DDG 51 class ships. The data collected supports a need for process improvement which is illustrated by the authors in this study in APPENDIX F. In order to accurately collect the needed data to assess the effectiveness of an entire shipboard phased-replacement program, the authors believe that 12 to 18 months of data collected via a standardized process such as the one suggested, would be enough to make accurate assessments in this regard while allowing the TYCOM increased visibility over budget shortfalls and potential readiness issues.

⁴⁴ ATG, email with authors, 16 April, 2009.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A

A. AFMP MANAGEMENT

The amplified guidance to accomplish the calculations and complete the AFMP is set forth below:

Determine Tentative Departmental Funding Targets. Within the total expected funding and based on the past four to six quarters' historical data, with similar periods appropriately weighed, the Supply Officer should assign tentative funding targets to the departments. In addition to the tentative target, assign an increment and decrement representing alternative funding levels above and below the tentative target, respectively. An increment of 10 percent and a decrement of 15 percent is suggested (i.e., assigned target is \$10,000, increment level (enhanced funding) is \$11,000 and decrement level (funding cut) is \$8,500). Separate targets may be provided for each category of funds granted in the basic OPTAR (EMRM/Other) depending on the command's funding policy for repair parts and centrally managed programs. Specify the tentative targets and increment/decrement levels in the budget call. The past quarterly spending data used to determine the target may also be included for information.⁴⁵

After setting tentative target funding levels, the Supply Officer must also look at how this overlay with the priorities of the ship, to include the deployment and work-up dates, the Commanding Officer and the phased-replacement timeline. Again, the SURFSUP gives the Supply Officer guidance:

Determine, Prioritize, and Time-Phase Requirements. Department Heads and subordinates will decide and itemize all their requirements, considering the nature and purpose of funds and other special guidance in the budget call, historical data, top ten critical equipment, PMS schedule, special programs, centrally funded items for which they are responsible, etc. The requirements lists may include "nice-to-have" items in addition to the essential supplies. When nice requirements have been identified, associated prices should be determined or estimated. Accurate pricing is critical. Next, requirements should be prioritized. The same requirement may be split and different priorities assigned to each segment (i.e., 0 gas

⁴⁵ Commander, Naval Surface Forces. COMNAVSURFOR INSTRUCTION 4400.1. Surface Force Supply Procedures. San Diego, CA. 2008.

masks are budgeted; 20 are required immediately, 20 more are needed but not as urgently, the last 10 are nice-to have). Once the total requirements have been determined, the requirements must show the quarter in which procurement is desired. Some items are needed each quarter in uniform increments throughout the year (i.e., PMS material, cleaning gear); some are needed at a specific time (i.e., office equipment rental at the beginning of the year, pre-deployment preps); and some may not be particularly time sensitive (i.e., habitability upgrade, typewriter replacement). The requirements list should indicate priority, requirement description, quantity, quarterly cost, total cost and cumulative costs for the specific and all higher priorities. For requirements exceeding the decrement level (i.e., requirements at the margin), justification for the items and impact if not funded should be required. This information will be very important for ship-wide prioritization. Ranking must be realistic (i.e., do not place high priority items below assigned target as an unfunded material requirement in an attempt to obtain additional funds). Prioritization and ranking enables the AFMP to remain executable if additional funds become available or funds are reduced. (For COMNAVSURFLANT ships only) Quarterly phasing plan should result in no more than 10% unobligated balance at end of first, second and third quarters.⁴⁶

⁴⁶ Commander, Naval Surface Forces. COMNAVSURFOR INSTRUCTION 4400.1. Surface Force Supply Procedures. San Diego, CA. 2008.

Table 4. Sample Annual Financial Management Plan

USS ALWAYSAIL (DDG 00)

Annual Financial Plan							
EMRM			FY 09 QTR 1	FY 09 QTR 2	FY 09 QTR 3	FY 09 QTR 4	TOTAL
	Combat Systems		\$100,000.00	\$100,000.00	\$100,000.00	\$100,000.00	\$400,000.00
	Weapons		\$40,000.00	\$40,000.00	\$40,000.00	\$40,000.00	\$160,000.00
	Engineering		\$80,000.00	\$80,000.00	\$80,000.00	\$80,000.00	\$320,000.00
	Executive		\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$4,000.00
	Operations		\$15,000.00	\$15,000.00	\$15,000.00	\$15,000.00	\$60,000.00
	Supply		\$90,000.00	\$90,000.00	\$90,000.00	\$90,000.00	\$360,000.00
	TOTAL		\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
OTHER	Combat Systems						
		Admin Supplies	\$400.00	\$400.00	\$400.00	\$400.00	\$1,600.00
		Phased Replacement	\$750.00	\$750.00	\$750.00	\$750.00	\$3,000.00
	Weapons						
		Force Protection	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$4,000.00
		Phased Replacement	\$500.00	\$500.00	\$500.00	\$500.00	\$2,000.00
	Engineering						
		Admin Supplies	\$400.00	\$400.00	\$400.00	\$400.00	\$1,600.00
		Damage Control	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$8,000.00
		Phased Replacement	\$750.00	\$750.00	\$750.00	\$750.00	\$3,000.00
	Executive						
		Commanding Officer	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$8,000.00
		Ombudsman	\$500.00	\$500.00	\$500.00	\$500.00	\$2,000.00
		Medical	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$12,000.00
		Admin	\$600.00	\$600.00	\$600.00	\$600.00	\$2,400.00
		Phased Replacement	\$250.00	\$250.00	\$250.00	\$250.00	\$1,000.00
	Operations						
		Admin Supplies	\$300.00	\$300.00	\$300.00	\$300.00	\$1,200.00
		Phased Replacement	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$4,000.00
	Supply						
		Admin Supplies	\$600.00	\$600.00	\$600.00	\$600.00	\$2,400.00
		Habitability	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$4,000.00
		Services (PVST)	\$8,500.00	\$8,500.00	\$8,500.00	\$8,500.00	\$34,000.00
		HAZMAT	\$2,500.00	\$2,500.00	\$2,500.00	\$2,500.00	\$10,000.00
		Phased Replacement	\$400.00	\$400.00	\$400.00	\$400.00	\$1,600.00
	TOTAL		\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
	TOTAL phased-replacement Cost		\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX B

Table 5 depicts the weights assigned by the authors in determination of what items were to be included on the suggested PRP listing for Repair Locker Two onboard DDG 51 Class ships.

Table 5. PRP Weighted Determination

<i>WEIGHTED MODEL FOR PRP</i>			OI	SI	SME	SDD	Total
NOMENCLATURE	NIIN	WEIGHT	0.25	0.25	0.25	0.25	
WASHER,FLAT	002391882		0	0	0	1	0.25
GLOVES,MEN'S	002688350		0	0	0	1	0.25
LINK,FUSIBLE,FIRE	004433526		0	0	0	0	0
NOZZLE,FIRE HOSE	004651906		1	1	0	1	0.75
CARTRIDGE,COMPRESSED GAS	005436693		1	0	0	0	0.25
HEADSET-CHEST SET,ELECTRICAL	009006401		0	0	0	1	0.25
CARTRIDGE,GAS PRESSURE	009351669		0	0	0	0	0
DISK,FOIL,FUSIBLE	010241181		0	0	0	1	0.25
NOZZLE APPLIANCE	010615705		0	0	0	0	0
2-1/2 HOSES	011310247		1	1	1	0	0.75
1-3/4 HOSES	011431404		1	1	1	0	0.75
EXTINGUISHER,FIRE	011471091		0	0	0	1	0.25
CABLE,SPECIAL PURPOSE,ELECTRIC	012027764		0	0	0	1	0.25
GASKET,RESPIRATOR	012515349		0	0	0	1	0.25
GASKET,SEAT,RESPIRATOR	012515372		0	0	0	1	0.25
FLASH GLOVES	012679661		1	0	1	1	0.75
FIREFIGHTING HELMETS	012718069		1	1	1	0	0.75
EXTINGUISHER,FIRE	013722899		0	0	0	1	0.25
HOSE ASSEMBLY,NONMETALLIC,FIRE	013742467		0	0	0	1	0.25
HOSE AND HORN ASSEMBLY,EXTINGU	013773467		0	0	0	1	0.25
HORN AND CLAMP ASSEMBLY	013777828		0	0	0	1	0.25
VOICE AMPLIFIER	014393958		1	0	0	1	0.5
BREATHING APPARATUS,OXYGEN GEN	014395937		0	0	0	1	0.25
LENS,FACEPIECE,CHEMICAL-BIOLOG	014493114		0	0	0	1	0.25
VALVE,BREATHING APPARATUS	014495342		1	0	0	1	0.5
HARNESS ASSEMBLY,MASK,OXYGEN	014582127		1	1	0	0	0.5
FIREFIGHTING HOODS	014627670		1	1	1	1	1
BRACKET,MOUNTING,VOICE AMPLIFI	014895477		1	1	0	0	0.5
HOOD,ANTI-FLASH,FIREMENS	014934694		1	1	1	1	1
FIREFIGHTING HELMET LIGHTS	015289015		1	1	1	0	0.75
FIREFIGHTING ENSAMBLE	Various		1	1	1	0	0.75
FIREFIGHTING COVERALLS	Various		1	1	1	1	1
SCBA	Various		1	0	1	1	0.75
FIREFIGHTING GLOVES	Various		1	1	1	1	1
FIREFIGHTING BOOTS	Various		1	1	1	0	0.75
DRAGGER TUBES	Various		1	1	1	0	0.75
BATTERIES	Various		1	1	1	0	0.75
EWARP			1	1	1	0	0.75

Figure 7 illustrates the process the authors used to determine what items were to be included on the suggested PRP listing for Repair Locker Two onboard DDG 51 Class ships.

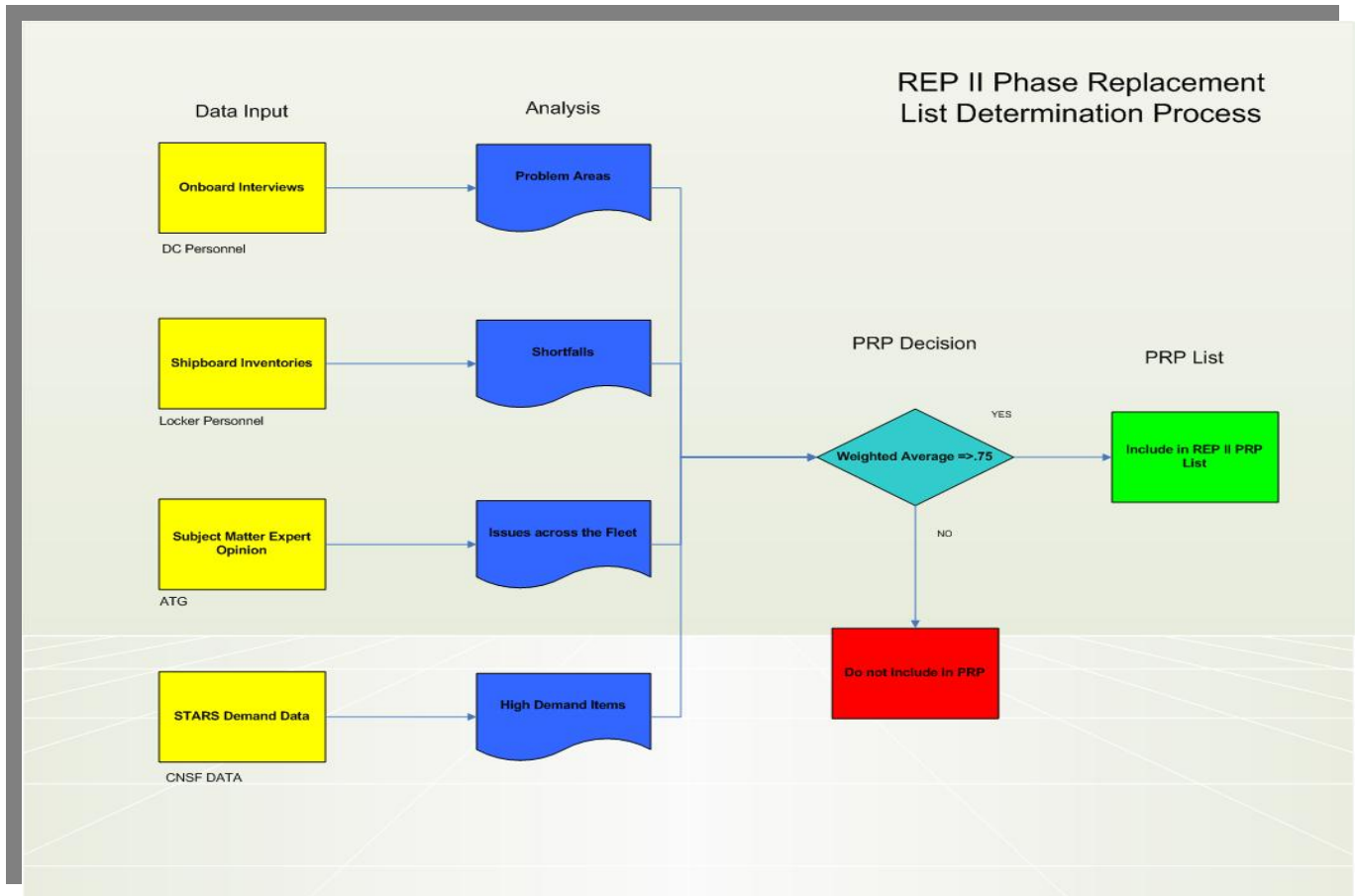


Figure 7. Phased-replacement Determination

APPENDIX C

A. REPAIR LOCKER TWO PHASED-REPLACEMENT LISTING

Based on the data gathered for this project, Table 6, created by the authors, lists suggested items to be included in the PRP listing for Repair Locker Two. It is suggested that a form such as this be completed monthly by the Division Officer and submitted to the Shipboard Supply Officer for inclusion into the ship-wide PRP. This form will assist the Supply Officer in developing the AFMP and required quarterly updates.

Table 6. Suggested Phased-replacement Item List for Repair Locker Two

USS ALWAYS SAIL (DDG 00)

Divisional phased-replacement Plan

	Periodicity	NIIN	U/I	Quantity	Unit Price	Total Cost
Flash Hoods	QTR	14934694	EA	10	\$15.19	\$151.90
Flash Gloves	QTR	12679661	PR	5	\$4.76	\$23.80
Firefighting Ensembles	QTR	Various	EA	1	\$1,059.58	\$1,059.58
Firefighting Coveralls	QTR	Various	EA	10	\$50.45	\$504.50
SCBA	SEMI	Various	EA	1	\$1,600.00	\$800.00
1-3/4 Hoses	QTR	11431404	EA	1	\$83.48	\$83.48
2-1/2 Hoses	QTR	11310247	EA	1	\$119.03	\$119.03
Firefighting Gloves	QTR	Various	PR	5	\$46.50	\$232.50
Firefighting Hoods	QTR	14627670	EA	5	\$39.57	\$197.85
Firefighting Helmets	QTR	12718069	EA	2	\$160.48	\$320.96
Firefighting Helmet Lights	QTR	15289015	EA	2	\$23.85	\$47.70
Firefighting Boots	QTR	Various	EA	2	\$62.75	\$125.50
Dragger Tubes	SEMI	Various	SET	1	\$85.00	\$42.50
Batteries	QTR	Various	PKG	5	\$8.00	\$40.00
EWARP	SEMI	Various	SET	1	\$200.00	\$100.00

QUARTERLY TOTAL

\$3,849.30

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX D

Figure 8 outlines the authors' recommended PRP process from the ships to DDGRON and TYCOM. It is important to note on this flowchart that the DDGRON is where the data is captured. This is where the data collection for future process improvement analysis could come from.

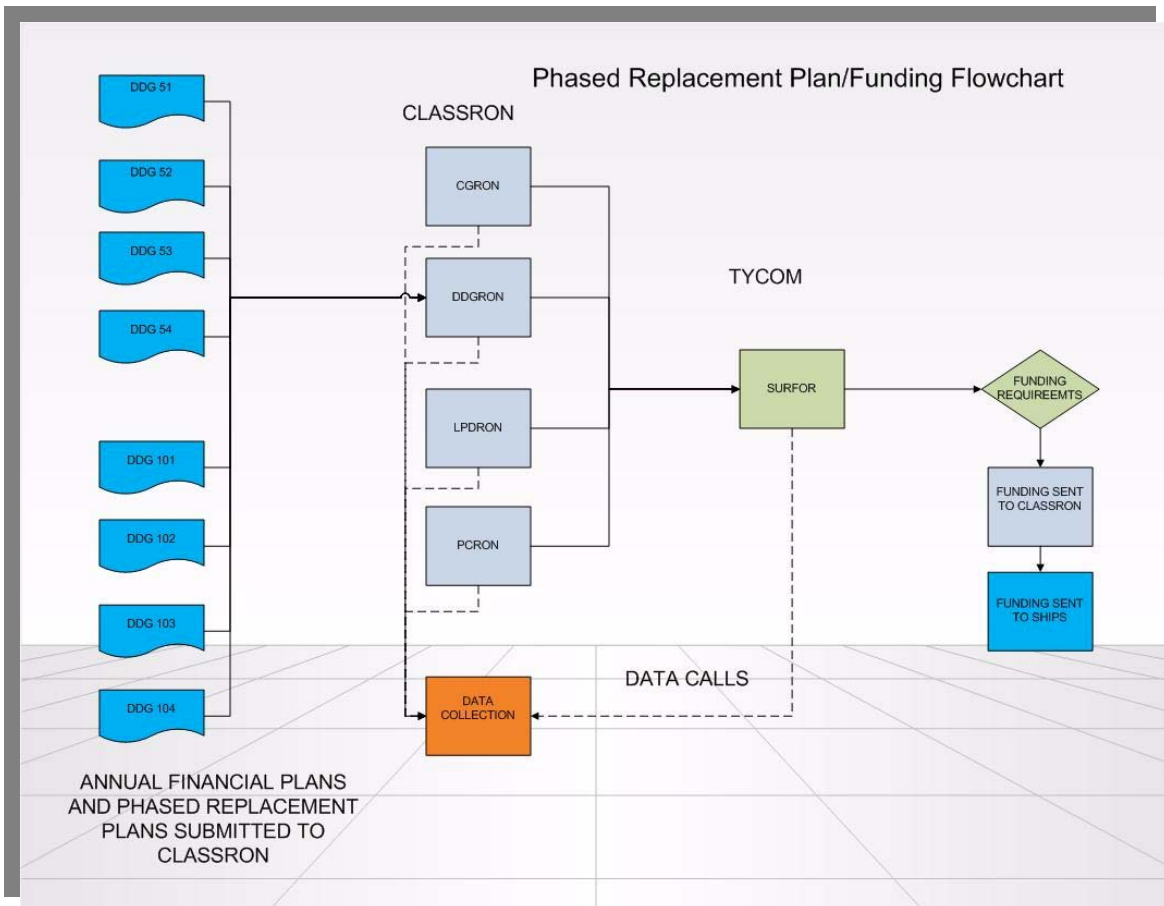


Figure 8. Phased-replacement Funding Flowchart

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX E

Table 7. Suggested GPC Purchase Card Log for use at the Unit Level for Submission to the DDGRON and TYCOM

FY 09 Government Purchase Card Log Submission

NO	COMPANY	ITEM	ORDERED	RECEIVED	WORK CENTER	PRP ITEM	QTY	U/P	TOTAL PRICE
C002	Stoody's	CO2 Refill	5-Oct-08	10-Oct-08	ER04	NO	1	\$320.00	\$320.00
C004	Bulwark	Fire Retardant Coveralls	10-Oct-08	10-Oct-08	ER04	YES	15	\$29.45	\$441.75
C012	Rice Hydro	Fire Hose Hydro Tester	20-Oct-08	23-Oct-08	ER04	NO	1	\$1,705.00	\$1,705.00
C020	Bulwark	Fire Retardant Coveralls	16-Nov-08	23-Nov-08	ER04	YES	25	\$29.45	\$736.25
C021	Stoody's	5lb CO2 actuator	18-Nov-08	26-Nov-08	ER04	NO	1	\$1,420.00	\$1,420.00
C025	Bulwark	Fire Fighters Hood	6-Dec-08	9-Dec-08	ER04	YES	20	\$31.11	\$622.20
TOTAL									<u>\$5,245.20</u>

Phased Replacement costs	\$1,800.20
--------------------------	------------

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX F

Table 8. Suggested AFMP for the DDGRON for Use in Projecting
Quarterly Budget Grants

EMRM	FY 09 QTR 1	FY 09 QTR 2	FY 09 QTR 3	FY 09 QTR 4	TOTAL
DDG 51	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 52	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 53	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 54	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 55	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 56	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 57	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 58	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 59	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 60	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 61	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 62	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 63	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 64	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 65	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 66	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 67	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 68	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 69	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 70	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 71	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 72	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 74	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
DDG 75	\$326,000.00	\$326,000.00	\$326,000.00	\$326,000.00	\$1,304,000.00
TOTAL	\$7,824,000.00	\$7,824,000.00	\$7,824,000.00	\$7,824,000.00	\$31,296,000.00

OTHER

	FY 09 QTR 1	FY 09 QTR 2	FY 09 QTR 3	FY 09 QTR 4	TOTAL
DDG 51	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 52	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 53	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 54	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 55	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 56	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 57	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 58	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 59	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 60	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 61	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 62	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 63	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 64	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 65	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 66	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 67	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 68	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 69	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 70	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 71	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 72	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 74	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
DDG 75	\$26,450.00	\$26,450.00	\$26,450.00	\$26,450.00	\$105,800.00
TOTAL	\$634,800.00	\$634,800.00	\$634,800.00	\$634,800.00	\$2,539,200.00

PRP

	FY 09 QTR 1	FY 09 QTR 2	FY 09 QTR 3	FY 09 QTR 4	TOTAL
DDG 51	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 52	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 53	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 54	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 55	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 56	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 57	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 58	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 59	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 60	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 61	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 62	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 63	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 64	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 65	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 66	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 67	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 68	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 69	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 70	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 71	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 72	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 74	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
DDG 75	\$3,650.00	\$3,650.00	\$3,650.00	\$3,650.00	\$14,600.00
TOTAL	\$87,600.00	\$87,600.00	\$87,600.00	\$87,600.00	\$350,400.00

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX G

Table 9. Suggested AFMP for the TYCOM for Use in Projecting Budget Grants

CNSF Annual Financial Plan

EMRM	FY 09 QTR 1	FY 09 QTR 2	FY 09 QTR 3	FY 09 QTR 4	TOTAL
DDGRON	\$17,278,000.00	\$17,278,000.00	\$17,278,000.00	\$17,278,000.00	\$69,112,000.00
CGRON	\$17,278,000.00	\$17,278,000.00	\$17,278,000.00	\$17,278,000.00	\$69,112,000.00
PCRON	\$17,278,000.00	\$17,278,000.00	\$17,278,000.00	\$17,278,000.00	\$69,112,000.00
LPDRON	\$17,278,000.00	\$17,278,000.00	\$17,278,000.00	\$17,278,000.00	\$69,112,000.00
TOTAL	\$69,112,000.00	\$69,112,000.00	\$69,112,000.00	\$69,112,000.00	\$276,448,000.00

OTHER	FY 09 QTR 1	FY 09 QTR 2	FY 09 QTR 3	FY 09 QTR 4	TOTAL
DDGRON	\$1,401,850.00	\$1,401,850.00	\$1,401,850.00	\$1,401,850.00	\$5,607,400.00
CGRON	\$1,401,850.00	\$1,401,850.00	\$1,401,850.00	\$1,401,850.00	\$5,607,400.00
PCRON	\$1,401,850.00	\$1,401,850.00	\$1,401,850.00	\$1,401,850.00	\$5,607,400.00
LPDRON	\$1,401,850.00	\$1,401,850.00	\$1,401,850.00	\$1,401,850.00	\$5,607,400.00
TOTAL	\$5,607,400.00	\$5,607,400.00	\$5,607,400.00	\$5,607,400.00	\$22,429,600.00

PRP	FY 09 QTR 1	FY 09 QTR 2	FY 09 QTR 3	FY 09 QTR 4	TOTAL
DDGRON	\$193,450.00	\$193,450.00	\$193,450.00	\$193,450.00	\$773,800.00
CGRON	\$193,450.00	\$193,450.00	\$193,450.00	\$193,450.00	\$773,800.00
PCRON	\$193,450.00	\$193,450.00	\$193,450.00	\$193,450.00	\$773,800.00
LPDRON	\$193,450.00	\$193,450.00	\$193,450.00	\$193,450.00	\$773,800.00
TOTAL	\$773,800.00	\$773,800.00	\$773,800.00	\$773,800.00	\$3,095,200.00

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

- Chase, R.B., Jacobs, R.F., Aquilano, N.J. (2006). *Operations Management for Competitive Advantage* (11ed.). New York, NY: McGraw Hill.
- Commander, Naval Surface Forces. (2008). COMNAVSURFOR INSTRUCTION 4400.1. Surface Force Supply Procedures. San Diego, CA.
- First Atlantic Fleet Sea Swap Crews Will Have Time To Adapt To New Ships*. (2004, October). Defense Daily, 224(7), 1.
- United States. Government Accountability Office (2008) *GAO Report, Military Readiness, The Navy is making progress implementing its Fleet Response Plan, but has not fully developed goals, measures and resource needs*. GAO-08-264 Washington, DC. U.S. Government Accountability Office.
- GAO Report Recommends Navy Evaluate Sea Swap Methodology*. (2004, November). Defense Daily, 224(23), 1.
- Jones, L. & McCaffery, J. (2008). *Budgeting, Financial Management, and Acquisition Reform in the U.S. Department of Defense*. Charlotte, NC: Information Age.
- Keeter, H.C. (2004, May). *Roughhead: Executing FRP Means Projecting Power Quickly*. Sea Power, 47(5), 36, 38, 40.
- Kime, P. (2004). *CNA Report on Sea Swap Exercises Gives Experiment Mixed Reviews*. Sea Power, 47(9), 32, 34.
- Naval Supply Instruction. (2006). NAVSUPINST 4200.99. Mechanicsburg, PA: Naval Supply Systems Command.
- Naval Supply Procedures. (1997). NAVSUP P485 Volume 1. Mechanicsburg, PA: Naval Supply Systems Command.
- Naval Supply Procedures. (1997). NAVSUP P485 Volume 2. Mechanicsburg, PA: Naval Supply Systems Command.
- Naval Supply Systems Command. (1999). *It's your Career*. Mechanicsburg, PA.

THIS PAGE INTENTIONALLY LEFT BLANK

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
Ft. Belvoir, Virginia
2. Dudley Knox Library
Naval Postgraduate School
Monterey, California
3. Commander, Naval Surface Force Comptroller
San Diego, California
4. Guided Missile Destroyer Class Squadron
Norfolk, Virginia
5. Professor Kenneth J. Euske
Naval Postgraduate School
Monterey, California
6. CDR Brett Wagner
Naval Postgraduate School
Monterey, California
7. LCDR Vincent Erno
Naval Postgraduate School
Monterey, California
8. LCDR Michael Snyder
Naval Postgraduate School
Monterey, California